

Notice of Allowability

Application No.

10/785,217

Examiner

Danny Wai Lun Leung

Applicant(s)

PARK ET AL.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to communication filed 2/24/2004.
2. ☒ The allowed claim(s) is/are 1-26.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

DETAILED ACTION

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Allowable Subject Matter

2. Claims 1-26 are allowed over prior art.
3. The following is an examiner's statement of reasons for allowance:
4. Regarding claims 1, 10, and 19, US Patent Application Publication Number 2002/0197012 A1 to **Liu et al.** teaches a bidirectional optical add-drop multiplexer (*fig 1*) for WDM (wavelength division multiplexing) optical signals being transmitted in directions opposite to each other through different WDM channels ($\lambda_1, \lambda_2, \lambda_3, \lambda_4, \lambda_1', \lambda_2', \lambda_3', \lambda_4'$, *fig 1*), said multiplexer comprising: a first WDD (wavelength division demultiplexer) (*105, fig 1*) which drops an optical signal having a specific wavelength by demultiplexing optical WDM signals transmitted through a first portion of said one optical transmission line; a first optical wavelength selector (*107, fig 1*) reflecting an optical signal that is to be added among optical signals inputted, and passes optical signals not being added; a second WDD (*103, fig 1*) which drops an optical signal having a specific wavelength by demultiplexing optical WDM signals transmitted through said second portion, and transmits to said second portion optical signals inputted; and a second optical wavelength selector (*109, fig 1*) reflecting an optical signal having a wavelength that is to be added among the optical signals inputted and passes optical signals not being added. **Liu** does not teach wherein the optical signals are being transmitted in one optical transmission line in an optical WDM bidirectional ring network, or having first and second optical circulators each

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having four ports, and having the specific ports of the two circulators connecting to the wavelength selectors and the WDDs as required by claims 1, 10, and 19.

5. Regarding claims 1, 10, and 19, US Patent Application Publication Number 2004/0151493 A1 to **Kim et al.** teaches a bidirectional optical add-drop multiplexer (*310a, fig 2*) for WDM (wavelength division multiplexing) optical signals being transmitted in directions opposite to each other through different WDM channels ($\lambda_1, \lambda_2, \lambda_3 \dots \lambda_N$) of one optical transmission line (*fiber 1*) in an optical WDM bidirectional ring network (*fig 2b*), said multiplexer comprising: first and second optical circulators (*cir 11, cir 12, fig 2b*). **Kim** does not disclose expressly wherein each of the circulators having four ports, and among the ports, respective first ports for input of an optical signal having a wavelength to be added; a first WDD (wavelength division demultiplexer) which drops an optical signal having a specific wavelength by demultiplexing optical WDM signals transmitted through a first portion of said one optical transmission line, outputs to a third port of the first optical circulator optical signals not being dropped, and transmits to said first portion optical signals from a second portion of said optical transmission line inputted from the third port of the first optical circulator; a first optical wavelength selector which is connected between a fourth port of the first optical circulator and a second port of the second optical circulator, reflects an optical signal that is to be added among optical signals inputted from the third port of the first optical circulator, and passes optical signals not being added; a second WDD which drops an optical signal having a specific wavelength by demultiplexing optical WDM signals transmitted through said second portion, outputs to a third port of the second optical circulator optical signals not being dropped, and

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transmits to said second portion optical signals inputted from the third port of the second optical circulator; and a second optical wavelength selector which is connected between a second port of the first optical circulator and a fourth port of the second optical circulator, reflects an optical signal having a wavelength that is to be added among the optical signals inputted from the third port of the second optical circulator, and passes optical signals not being added, as required by claims 1, 10, and 19.

6. Regarding claims 1, 10, and 19, US Patent Application Publication Number US 20020196495A1 to **Grasso et al.** teaches a bidirectional optical add-drop multiplexer (*fig 8*) for WDM (wavelength division multiplexing) optical signals being transmitted in directions opposite to each other through different WDM channels of one optical transmission line, said multiplexer comprising: first and second optical circulators (*951, 961, fig 8*), having respective first ports for input of an optical signal having a wavelength to be added (*951, 960, fig 8*); a first WDD (wavelength division demultiplexer) (*957, fig 8*) which drops an optical signal having a specific wavelength by demultiplexing optical WDM signals transmitted through a first portion of said one optical transmission line, outputs to a third port of the first optical circulator optical signals not being dropped, and transmits to said first portion optical signals from a second portion of said optical transmission line inputted from the third port of the first optical circulator; a first optical wavelength selector (*959, fig 8*) which is connected between the first optical circulator and the second optical circulator, reflects an optical signal that is to be added among optical signals inputted from the third port of the first optical circulator, and passes optical signals not being added; a second WDD (*967, fig 8*) which drops an optical signal having a specific

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wavelength by demultiplexing optical WDM signals transmitted through said second portion, outputs to a third port of the second optical circulator optical signals not being dropped, and transmits to said second portion optical signals inputted from the third port of the second optical circulator; and a second optical wavelength selector (969, fig 8) which is connected between the first optical circulator and the second optical circulator, reflects an optical signal having a wavelength that is to be added among the optical signals inputted from the third port of the second optical circulator, and passes optical signals not being added. **Grasso** does not disclose expressly wherein the optical add-drop multiplexer is being used in an optical WDM bidirectional ring network, nor does **Grasso** teach the circulators each having four ports, and having the first optical wavelength selector connected between a fourth port of the first optical circulator and a second port of the second optical circulator, and the second wavelength selector connected between a second port of the first optical circulator and a fourth port of the second optical circulator, as required by claims 1, 10, and 19.

7. Regarding claims 1, 10, and 19, US Patent Number 7,092,634B2 to **Lee et al.** teaches a bidirectional optical add-drop multiplexer (*RNI, fig 1*) for WDM (wavelength division multiplexing) optical signals being transmitted in directions opposite to each other through different WDM channels ($\lambda_{1,2,3,4}$, *fig 1*) in an optical WDM bidirectional ring network, said multiplexer comprising: *an add multiplexer (AM) and a drop demultiplexer (DD)*

wherein the add multiplexer and the drop demultiplexer each comprising first and second optical circulators (14a, 14b, fig 6 and fig 7) each having four ports, and among the ports,

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respective first ports for input of an optical signal having a wavelength to be added (*fig 7 add signals to each of the 2 multiplexer*);

the drop demultiplexer comprising a first WDD (wavelength division demultiplexer) (fig 6) which drops an optical signal having a specific wavelength by demultiplexing optical WDM signals transmitted through a first portion of an optical transmission line (12, fig 6), outputs to a third port of the first optical circulator optical signals not being dropped (col 8, ln 23-31);

the add multiplexer comprising a first optical wavelength selector which is connected between a fourth port of the first optical circulator and a second port of the second optical circulator (16a, between 14a and 14b, fig 7), reflects an optical signal that is to be added among optical signals inputted from the third port of the first optical circulator, and passes optical signals not being added (col 8, ln 31-47); and a second optical wavelength selector which is connected between a second port of the first optical circulator and a fourth port of the second optical circulator, reflects an optical signal having a wavelength that is to be added among the optical signals inputted from the third port of the second optical circulator, and passes optical signals not being added (16b, between 14b and 14a, fig 7)..

However, Lee's drop demultiplexer and add multiplexer do not appear to be optically connected together (*fig 1, 6, 7*), therefore, recitations regarding Lee's optical connections between the first port, the second port, the third port, and the fourth port of the first and the second circulators are not expressly anticipated, *since, for example, the third port of the first optical circulator of the drop demultiplexer is not the third port of the first optical circulator of the add multiplexer*. Furthermore, Lee does not expressly teaches wherein the optical signals are being transmitted in one optical transmission line, or having the demultiplexing optical WDM

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signals transmitted to said first portion optical signals from a second portion of said optical transmission line inputted from the third port of the first optical circulator, or having a second WDD which drops an optical signal having a specific wavelength by demultiplexing optical WDM signals transmitted through said second portion, outputs to a third port of the second optical circulator optical signals not being dropped, and transmits to said second portion optical signals inputted from the third port of the second optical circulator.

8. US Patent Number 5,825,520 to **Hubber**, and US Patent Number 5,812,306 to **Mizrahi** teaches four-port circulators with reflective gratings, but does not expressly teach using two four-port circulators in a bidirectional optical add-drop multiplexer for WDM (wavelength division multiplexing) optical signals being transmitted in directions opposite to each other through different WDM channels of one optical transmission line in an optical WDM bidirectional ring network, or having specific connections between the four ports of the two circulators as recited in claims 1, 10, and 19.

9. The examiner found no suggestions or motivations to combine teachings from prior art made of record to overcome the limitations as discussed above.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Danny Wai Lun Leung whose telephone number is (571) 272-5504. The examiner can normally be reached on 9:30am-9:00pm Mon-Thur.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (571) 272-3022. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DWL
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